

30.

Parasites Obtained from Animals in the Collection of the  
New York Zoological Park during 1938.

CARLTON M. HERMAN, SC.D.

*Hospital and Laboratory, New York Zoological Park*

During the year 1938 parasites were collected from many of the animals exhibited at the New York Zoological Park. Most of these parasites were collected at autopsy, but a few are reported from examination of the blood or feces of living animals.

This report is not intended to represent the complete prevalence of parasites in the animals examined. For the most part only those parasites which appeared grossly during the routine procedure of an autopsy were collected, detailed examination being made in only a few animals. In some cases post mortem changes had progressed to a point such that the parasites could not be classified beyond class or family but an effort has been made wherever possible to identify the organisms to species.

Some of the parasites were classified at the Hospital and Laboratory of the Park but most of them were referred to specialists in some particular branch of parasite taxonomy, either for the original identification or for confirmation. Thanks are here extended to the following parasitologists for their cooperation in this work: Dr. J. Bequaert, Dr. F. C. Bishopp, Dr. H. E. Ewing, Mr. Howard R. Hill, Mr. J. T. Lucker, Dr. Irene McCulloch, Mr. A. McIntosh, Dr. O. Wilford Olsen, Dr. E. W. Price, Dr. C. R. Schroeder, Dr. E. W. Stafford and Dr. E. E. Wehr.

The infected animals and the parasites collected are listed in the two following tables. In Table I, the hosts are listed consecutively, while Table II contains a list of the parasites. The "Parasite No." in Table I refers to the "Parasite No." in Table II and shows what parasites were found in a particular host. Vice versa, the "Host No." in Table II refers to the "Host No." in Table I and shows what hosts were infected with any particular parasite.

TABLE I.  
Animals from which parasites were collected.

		REPTILIA	
		Squamata	
Host No.	Host		Parasite No.
1.	<i>Acrochordus javanicus</i> (Karung)	.....	30
2.	<i>Agkistrodon piscivorus</i> (Water Moccasin)	.....	3, 41, 63
3.	<i>Bitis arietans</i> (Puff Adder)	.....	30
4.	<i>Bitis gabonica</i> (Gaboon Viper)	.....	3, 19, 29, 33, 67
5.	<i>Boa canina</i> (Green Tree Boa)	.....	63
6.	<i>Constrictor c. constrictor</i> (South American Boa)	.....	9, 23, 26, 68

Host No.	Host	Parasite No.
7.	<i>Crotalus adamanteus</i> (Eastern Diamond-back Rattlesnake)	3, 33
8.	<i>Crotalus a. atrox</i> (Western Diamond-back Rattlesnake)	3, 33
9.	<i>Drymarchon corais melanurus</i> (Gopher Snake)	44
10.	<i>Epicrates cenchris</i> (Ringed Boa)	65
11.	<i>Eunectes murinus</i> (Anaconda)	7
12.	<i>Lachesis muta</i> (Bushmaster)	69
13.	<i>Lampropeltis getulus floridana</i> (King Snake)	35, 63
14.	<i>Notechis scutatus</i> (Tiger Snake)	63
15.	<i>Pseudechis porphyriacus</i> (Australian Black Snake)	63
16.	<i>Python regius</i> (Ball Python)	25, 28, 36
17.	<i>Python reticulatus</i> (Regal Python)	8, 21, 66
18.	<i>Spilotes pullatus</i> (South American Rat Snake)	61, 62, 65
19.	<i>Tiliqua scincoides</i> (Blue-tongued Lizard)	63
20.	<i>Tupinambis teguixin</i> (Tegu Lizard)	32

## AVES

Struthioniformes		
21.	<i>Struthio camelus massaicus</i> (Masai Ostrich)	60
Ciconiiformes		
22.	<i>Ciconia c. ciconia</i> (European White Stork)	46, 48, 49, 59
Anseriformes		
23.	<i>Anas p. platyrhynchos</i> (Mallard)	12, 13, 15, 42
24.	<i>Chloephaga melanoptera</i> (Andean Goose)	57
Falconiformes		
25.	<i>Pandion haliaëtus carolinensis</i> (American Osprey)	54
Galliformes		
26.	<i>Chrysolophus amherstiae</i> × <i>C. pictus</i> (Lady Amherst Pheasant × Golden Pheasant)	24, 53, 55
27.	<i>Francolinus squamatus maranensis</i> (Kenya Scaly Francolin)	39
28.	<i>Lophortyx c. californica</i> (California Quail)	56
29.	<i>Ortalis v. vetula</i> (Northern Chachalaca)	63
Gruiformes		
30.	<i>Balearica p. pavonina</i> (West African Crowned Crane)	20
Charadriiformes		
31.	<i>Numenius a. arquata</i> (European Curlew)	50, 51
Piciformes		
32.	<i>Pteroglossus i. inscriptus</i> (Lettered Aracari Toucan)	58
Passeriformes		
33.	<i>Astrapia s. stephaniae</i> (Princess Stephanie's Bird of Paradise)	2, 27
34.	<i>Cyanocorax cyanopogon</i> (Blue-bearded Jay)	64
35.	<i>Monticola solitaria philippensis</i> (Japanese Blue Rock Thrush)	64
36.	<i>Sarcops calvus</i> (Gray-backed Bald Myna)	7
37.	<i>Seleucidés m. melanoleucus</i> (Twelve-wired Bird of Paradise)	10, 14
38.	<i>Turdus m. migratorius</i> (Eastern Robin)	47

## MAMMALIA

Primates		
39.	<i>Ateles cucullatus</i> (Spider Monkey)	45
40.	<i>Hylobates l. lar</i> (Black Gibbon)	34

Host No.	Host	Parasite No.
41.	<i>Hylobates lar leuciscus</i> (White-handed Gibbon).....	7, 16, 22
42.	<i>Mandrillus sphinx</i> (Mandrill) .....	7, 31
43.	<i>Oedipomidas geoffroyi</i> (Cotton-top Marmoset).....	27
44.	<i>Pongo pygmaeus</i> (Orang-utan).....	1
Carnivora		
45.	<i>Canis dingo</i> (Dingo) .....	37
46.	<i>Felis leo</i> (Lion) .....	38
47.	<i>Lynx r. rufus</i> (Bay Lynx) .....	11, 17, 38, 39, 43
48.	<i>Nandinia binotata</i> (Two-spotted Palm Cat).....	16, 25
49.	<i>Procyon l. lotor</i> (Eastern Raccoon).....	18
Pinnepedia		
50.	<i>Zalophus californianus</i> (California Sea Lion) .....	40
Rodentia		
51.	<i>Erethizon d. dorsatum</i> (Canada Porcupine) .....	52
52.	<i>Castor canadensis canadensis</i> (Canadian Beaver).....	40
53.	<i>Nyctomys sumichrasti</i> (Sumichrast's Night-mouse).....	2, 6, 26
Artiodactyla		
54.	<i>Cervus elaphus</i> (Red Deer) .....	5
55.	<i>Hippotragus niger</i> (Sable Antelope) .....	7
56.	<i>Tragelaphus angasi</i> (Nyala) .....	7
Marsupialia		
57.	<i>Dendrolagus ursinus</i> (Black Tree Kangaroo).....	4
58.	<i>Macropus brunii</i> (Rock Wallaby) .....	4
59.	<i>Macropus g. giganteus</i> (Great Gray Kangaroo).....	4
60.	<i>Macropus melanops</i> (Black-faced Kangaroo).....	4
61.	<i>Macropus robustus woodwardi</i> (Woodward's Wallaroo) .	4
Xenarthra		
62.	<i>Dasypus novemcinctus texanus</i> (Texas Nine-banded Armadillo) .....	5

TABLE II.  
Parasites collected.

PROTOZOA

Parasite No.	Parasite	Host No.
1.	<i>Endamoeba histolytica</i> <sup>1</sup> .....	44
2.	Coccidia .....	33, 53
3.	Haemogregarinidae .....	2, 4, 7, 8
4.	<i>Pentatrichomonas macropi</i> <sup>2</sup> .....	57, 58, 59, 60, 61
5.	Sarcosporididae .....	54, 62
6.	<i>Trichomonas</i> sp. ....	53

CESTODA

7.	Unidentified cestodes .....	11, 36, 41, 42, 55, 56
8.	<i>Bothridium pithonis</i> .....	17
9.	<i>Crepidobothrium gerrardi</i> .....	6
10.	<i>Deltokeras multilobatus</i> , n. sp. <sup>3</sup> .....	37
11.	<i>Diphyllobothrium mansonioides</i> .....	47
12.	<i>Fimbriaria fasciolaris</i> .....	23
13.	<i>Haploparasis (furciger ?)</i> .....	23
14.	<i>Hymenolepis brevicirrosa</i> .....	37
15.	<i>Hymenolepis collaris</i> .....	23

<sup>1</sup> See Bibliography, Herman & Schroeder, 1939.

<sup>2</sup> See Bibliography, Herman, 1939.

<sup>3</sup> See Bibliography, Olsen, 1939.

## NEMATODA

Parasite No.	Parasite	Host No.
16.	Unidentified nematodes .....	41, 48
17.	<i>Ancylostoma braziliense</i> .....	47
18.	<i>Ascaris columnaris</i> .....	49
19.	<i>Capillaria</i> sp. ....	4
20.	<i>Cyathostoma</i> sp. ....	30
21.	<i>Dracunculus</i> sp. ....	17
22.	<i>Enterobius vermicularis</i> .....	41
23.	<i>Hastospiculum onchocercum</i> .....	6
24.	<i>Heterakis gallinae</i> .....	26
25.	<i>Kalicephalus</i> sp. ....	16
26.	<i>Kalicephalus subulatus</i> .....	6
27.	Microfilaria .....	33, 43
28.	<i>Ophidascaris filaria</i> .....	16
29.	<i>Ophidascaris</i> sp., probably <i>O. radiosa</i> .....	4
30.	<i>Ophidascaris</i> sp. ....	1, 3
31.	<i>Oesophagostomum</i> sp. ....	42
32.	<i>Physaloptera retusa</i> .....	20
33.	<i>Polydelphis</i> sp. ....	4, 7, 8
34.	<i>Protospirura</i> sp. ....	40
35.	<i>Rhabdias eustreptos</i> .....	13
36.	<i>Spinicauda</i> sp. ....	16
37.	<i>Toxacara canis</i> .....	45
38.	<i>Toxascaris leonina</i> .....	46, 47
39.	Trichiuridae (eggs in feces) .....	27, 47

## TREMATODA

40.	Unidentified trematodes .....	50, 52
41.	An undescribed species of styplodorid .....	2
42.	<i>Echinostomum revolutum</i> .....	23
43.	<i>Paragonimus</i> sp. ....	47
44.	<i>Rcnifer</i> sp. ....	9

## ANOPLURA

45.	<i>Pediculus (Parapediculus) chapini</i> .....	39
-----	--	----

## MALLOPHAGA

46.	<i>Ardeicola (Esthiopterum) ciconiae</i> .....	22
47.	<i>Briëlia (Degeeriella) vulgata</i> .....	38
48.	<i>Colpocephalum femoratum</i> .....	22
49.	<i>Colpocephalum zebra</i> .....	22
50.	<i>Cummingsiella testudinarius</i> .....	31
51.	<i>Degeeriella numenii</i> .....	31
52.	<i>Eutrichophilus setosus</i> .....	51
53.	<i>Goniocotes crysocephalus</i> .....	26
54.	<i>Kurodaia haliaëti</i> .....	25
55.	<i>Lipeurus caponis</i> .....	26
56.	<i>Menacanthus praecursor</i> .....	28
57.	<i>Menopon loomisi</i> .....	24
58.	<i>Myrsidea victrix</i> .....	32
59.	<i>Neophilopterus incompletus</i> .....	22
60.	<i>Struthiolipeurus struthionis</i> .....	21

## ACARINA

## Ixodoidea

61.	<i>Amblyomma dissimile</i> .....	18
62.	<i>Ornithodoros</i> sp. ....	18

## Acarina other than Ixodoidea

63.	Unidentified mites .....	2, 5, 14, 15, 19, 29
64.	<i>Dermanyssus</i> sp. ....	34, 35
65.	<i>Ophionyssus serpentium</i> .....	10, 13, 18

## PENTASTOMIDIA

Parasite No.	Parasite	Host No.
66.	Unidentified pentastomes .....	17
67.	<i>Armillifer armillatus</i> .....	4
68.	<i>Porocephalus clavatus</i> .....	6
69.	<i>Porocephalus stilesi</i> .....	12

## SUMMARY.

During 1938 autopsies were performed on 393 animals from the collection of the New York Zoological Park, including one amphibian, 103 reptiles, 159 birds and 130 mammals<sup>4</sup>. From these animals parasites were observed from 20 species of reptiles, 18 species of birds and 24 species of mammals. With the exception of the orang-utan and several of the kangaroos from which protozoa were diagnosed from fecal smears from the living animals, all material reported was obtained at autopsy. A few of the parasites reported here were observed in fecal smears in living animals and later confirmed at autopsy.

At least 70 species of parasites were collected, including at least 6 species of Protozoa, 9 Cestoda, 24 Nematoda, 5 Trematoda, 1 Anoplura, 15 Mallophaga, 5 Acarina and 4 Pentastomida. Protozoa were found in 14 species of animals, including 4 species of reptiles, 1 bird and 9 species of mammals. Cestodes were diagnosed from 11 species of vertebrates, including 3 species of snakes, 3 species of birds and 5 species of mammals. Nematodes are reported from 23 species of hosts, including 10 species of reptiles, 4 species of birds and 9 species of mammals. Trematodes were seen in 6 species of hosts, of which 2 were snakes, 1 was a bird and 3 were mammals. Anoplura were observed on only 1 mammal. Mallophaga were collected from 1 mammal and 9 species of birds. Ticks were collected from 1 reptile. Eight species of reptiles and 3 birds were parasitized with mites. Four species of snakes were infected with Pentastomida.

Some of the parasites collected during 1938 have been presented more in detail elsewhere. Reference is made in footnotes to Table II to these publications which are listed in the bibliography.

## BIBLIOGRAPHY.

- HERMAN, CARLTON M. & CHARLES R. SCHROEDER  
1939. Treatment of Amoebic Dysentery in an Orang-utan. *Zoologica*, 24:339.
- HERMAN, CARLTON M.  
1939. *Pentatrichomonas macropi* Tanabe from Kangaroos. *Zoologica*, 24:293.
- OLSEN, O. WILFORD  
1939. *Deltokeras multilobatus*, a New Species of Cestode (Parauterininae : Dilepiididae) from the Twelve-wired Bird of Paradise (*Seleucides melanoleucus* (Daudin) : Passeriformes). *Zoologica*, 24:341.
- SCHROEDER, C. R.  
1939. Report of the Hospital and Laboratory of the New York Zoological Park, 1938. Mortality Statistics of the Society's Collection. *Zoologica*, 24:265.

<sup>4</sup> See Bibliography, Schroeder, 1939.